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INAUGURAL ADDRESS
AT THE
SUMMER MEETING 1900

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“The Nineteenth Century”

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THE NINETEENTH CENTURY.

LADIES AND GENTLEMEN,

I FEEL that a speaker who has to address such an audience as the present on such a subject as "The Nineteenth Century" is bound to begin with an explanation which shall serve also as an apology. It is quite evident that even the most summary survey of so vast a theme could never be compressed within the compass of a single speech. Its various aspects have been parcelled out among the distinguished lecturers to whom the programme of this August meeting has been

entrusted, and I am not foolish enough to suppose that I can give you beforehand, and, as it were, by way of preface, the quintessence of that which they will have to tell you in detail.

Let it be therefore understood that my presence here is rather ceremonial than educational. My business is not so much to lecture as to open a course of lectures. I do not aspire to provide you with a survey or a criticism of any single phase of thought or action which has rendered the last hundred years memorable. I have neither moral to draw nor lesson to teach. My observations will be more in the nature of a conversation than of ordered narrative or reasoned discourse; and I trust that if any think it worth while to criticise what I have to say, their criticism will conform to the lax and charitable canons by which alone conversation should be judged.

My prescribed theme, then, is the Nineteenth Century. ✓ What is the nineteenth century? I do not mean to raise the controversy as to when the nineteenth century ends and the twentieth begins; a question, the eager discussion of which affords a striking proof of the aphorism^{WIS} that the pleasures of investigation do not lie so much in the acquisition of truth as in its pursuit. My enquiry aims at a different mark, and somewhat expanded it comes to this:—When we isolate a century for particular consideration, what kind of period have we in our minds? The negative answer at all events seems plain. It is seldom, except by accident, exactly a hundred years. Moreover, it is seldom, except by accident, precisely the same period for two aspects of what we loosely but conveniently call the same century. Nature does not exhibit her uniformity by any pedantic adherence to the decimal system; and if we

insist on substituting rigid and arbitrary divisions of historical time for natural ones, half the significance of history will be lost for us.

For example, if we had to put our fingers on the date which, in matters political, divided the last century from the present, we might for England choose the declaration of war with France in the last days of 1793; for France the assembling of the States General in 1789; for the United States of America, the declaration of Independence or the Peace of Versailles. For the corresponding event in literary history we might, perhaps, fix the publication of Lyrical Ballads in 1798 as the dawn of the new period for the English-speaking peoples; and it may be Chateaubriand's "*Génie du Christianisme*," in 1802, for the beginning in France. Science is cosmopolitan: and in dealing with it we may eliminate the particularities of race and language. But even in the case of science, the different

centuries, if they are to be spoken of as separate entities, must not be too rigidly defined. Some gentle violence must be done to chronology if epochs are to be profitably distinguished; and I imagine that those who are qualified to speak on such subjects (which I am not), would regard Laplace's "*Mécanique Céleste*" (though not completed till 1825), as the culminating performance of the old century; the theories of Young and Dalton as belonging essentially to the new.

Granting that a procedure of this kind is desirable if we are usefully to sum up the achievements of a particular epoch, it nevertheless remains true that no mere process of summation can quite explain the impression which different epochs produce on us. We cannot by cataloguing mental characteristics or describing face and figure, convey the impression of a human personality; neither can we by

a parallel process justify our sentiments about a century. Yet most of us have them. "The reason why we cannot tell, but only this we know full well," some centuries please us and some do not. It so happens, for example, that I dislike the seventeenth century and like the eighteenth. I do not pretend to justify my taste. Perhaps it is that there is a kind of unity and finish about the eighteenth century wanting to its predecessor. Perhaps I am prejudiced against the latter by my dislike of its religious wars, which were more than half political, and its political wars, which were more than half religious. In any case the matter is quite unimportant. What is more to our present purpose is to ask, whether the nineteenth century yet presents itself to any of us sufficiently as a whole to suggest any sentiment of the kind I have just illustrated. I confess that, for my own part, it does not. Of

that part of it with which most of us are alone immediately acquainted—say the last third—I feel I can in this connection say nothing. We are too much of it to judge it. The two remaining thirds, on the other hand, seem to me so different that I cannot criticise them together: and if I am to criticise them separately I acknowledge at once that it is the first third and not the second that engages my sympathies. There are those, I am aware, who think that the great Reform Bill was the beginning of wisdom. Very likely they are right. But this is not a question of right but a question of personal ^{special liking, preference} predilection, and from that point of view the middle third of the nineteenth century does not, I acknowledge, appeal to me. It is probably due to the natural ingratitude which we are apt to feel towards our immediate predecessors. But I justify it to myself by saying that it reminds me too

much of Landseer's pictures and the revival of Gothic; that I feel no sentiment of allegiance towards any of the intellectual dynasties which then held sway; that neither the thin lucidity of Mill nor the windy prophesyings of Carlyle, neither Comte nor yet Newman, were ever able to arouse in me the enthusiasm of a disciple: that I turn with pleasure from the Corn Law squabbles to the great War; from Thackeray and Dickens to Scott and Miss Austen, even from Tennyson and Browning to Keats, Coleridge, Wordsworth, and Shelley.

Observations like these, however, are rather in the nature of individual fancies than impersonal or "objective" criticisms, and I hasten to consider whether, apart altogether from likes and dislikes, there is any characteristic note which distinguishes this century from any that has gone before it.

On this point I range myself with those

who find this characteristic note in the Growth of Science. In the last hundred years the world has seen great wars, great national and social upheavals, great religious movements, great economic changes. Literature and Art have had their triumphs, and have permanently enriched the intellectual inheritance of our race. Yet, large as is the space which subjects like this legitimately fill in our thoughts, much as they will occupy the future historian, it is not among these that I seek for the most important and the most fundamental differences which separate the present from preceding ages. Rather is this to be found in the cumulative products of scientific research, to which no other period offers a precedent or a parallel. No single discovery, it may be, can be compared in its results to that of Copernicus. No single discoverer can be compared in genius to Newton. But in their total effects, the

advances made by the nineteenth century are not to be matched. The difficulty is not so much to find the departments of knowledge which are either entirely new or have suffered complete reconstruction, but to find the departments of knowledge in which no such revolutionary change has taken place. Classical scholarship, the political history of certain limited periods, abstract mechanics, astronomy, in so far as it depends on abstract mechanics—can this list be very greatly lengthened? I hardly think so. And if not, consider how vast must be the regions first effectuously conquered for knowledge during the period under discussion.

But not only is this surprising increase of knowledge new, but the use to which it has been put is new also. The growth of industrial invention is not a fact we are permitted to forget; we do, however, sometimes forget how

much of it is due to a close connection between theoretic knowledge and its utilitarian application, which in its degree is altogether unexampled in the history of mankind. It was dreamed of in the speculations of poet-philosophers like Bacon ; here and there it has been sporadically exemplified. Thus surgery must, I suppose, have depended largely on anatomy, navigation upon astronomy, telescope-making upon optics, and so on. But, speaking broadly, it was not till the present century that the laboratory and the workshop were brought into intimate connection ; that the man of practice began humbly to wait on the man of theory ; that the man of practice even discovered that a little theory would do him no irretrievable damage in the prosecution of his business.

I suppose that at this moment if we were allowed a vision of the embryonic forces which are predestined most potently to affect the

future of mankind, we should have to look for them, not in the legislature, nor in the press, nor on the platform, not in the schemes of practical statesmen, nor the dreams of political theorists, but in the laboratories of scientific students, whose names are but little in the mouths of men, who cannot themselves forecast the results of their own labours, and whose theories could scarce be understood by those whom they will chiefly benefit. •

I need hardly say that I do not propose, even in the rudest outline, to attempt any sketch of our gains from this most fruitful union between science and invention. I may, however, permit myself one parenthetical remark on an aspect of it which is likely more and more to thrust itself unpleasantly upon our attention.

Marvellous as is the variety and ingenuity of modern industrial methods, they almost all depend, in the last resort, upon our supply of

useful power, and our supply of useful power is principally provided for us by methods which, so far as I can see, have altered not at all in principle, and strangely little in detail, since the days of Watt. Coal, as we all know, is the chief reservoir of energy from which the world at present draws; and from which we in this country must always draw. But our main contrivance for utilising it is the steam-engine; and by its essential nature the steam-engine is extravagantly wasteful; so that when we are told, as if it was something to be proud of, that this is the age of steam, we may admit the fact, but can hardly share the satisfaction. Our coal-fields as we know too well are limited. We certainly cannot increase them; the boldest legislator would hesitate to limit their employment for purposes of domestic industry; so that the only possible alternative is to economise our method of consuming them. And for this there

would indeed seem to be a sufficiency of room. Let a second Watt arise; let him bring into general use some mode of extracting energy from fuel which shall only waste 80 per cent. of it—and lo! your coalfields, as sources of power, are doubled at once.

The hope seems a modest one, but apparently we are not yet in sight of its fulfilment; and therefore it is that we must qualify the satisfaction with which, at the end of the century, we contemplate the unbroken course of its industrial triumphs. We have, in truth, been little better than brilliant spendthrifts. Every new invention seems to throw a new strain upon the vast, but not illimitable, resources of nature. We dissipate in an hour what it required a thousand years to accumulate. Sooner or later the stored-up resources of the world will be exhausted. Humanity, having used or squandered its capital, will thence-

forward have to depend upon such current income as can be derived from the diurnal heat of the sun and the rotation of the earth, till, in the sequence of the ages, these also begin to fail. With such remote speculations we are not now concerned : it is enough for us to take note how rapidly the prodigious progress of recent discovery has increased the drain upon the natural wealth of old manufacturing countries, and especially of Great Britain ; and at the same time frankly to recognise that it is only by new inventions that the collateral evils of old inventions can be mitigated ; that to go back is impossible ; that our only hope lies in a further advance.

After all, however, it is not necessarily the material and obvious results of scientific discoveries which are of the deepest interest. They have effected changes more subtle and perhaps less obvious, which are at least as

worthy of our consideration, and are at least as unique in the history of the civilised world.

No century has seen so great a change in our intellectual apprehension of the world in which we live. If we could construct an imaginary conversation between a man of science who lived a century ago and one who lived two centuries ago—say between Priestley, who died in 1804, and Hooke, who died in 1703—we should, I think, represent the interlocutors as addressing one another, so to speak, on equal terms. Though discoveries which have subsequently proved to be of the most far-reaching importance had been made in the interval, these had as yet effected no great revolution in general modes of thought. Indeed it may be suspected that the earlier philosopher would have been in some respects nearer to the moderns than the later. But leap over another

hundred years, and imagine Priestley conversing with any of the gentlemen who have promised to take part in the proceedings we are inaugurating to-day, and a very different state of affairs would then present itself. It is not merely that this century has witnessed a prodigious and unexampled growth in our stock of knowledge;—for new knowledge might accumulate without end, and yet do no more than fill in, without materially changing, the outline already traced by the old. Something much more important than this has happened. Our whole point of view has altered. The mental framework in which we arrange the separate facts in the world of men and things is quite a new framework. The spectacle of the universe presents itself now in a wholly changed perspective: we not only see more but we see differently.

The revolution is comparable to that other

revolution produced by the joint effect of the heliocentric hypothesis already referred to, and the discovery of America. But it is surely far greater. Columbus and Copernicus gave an extraordinary extension to our conception of the world in space. The one showed how much larger was the habitable globe than we had conceived it ; the other showed how much smaller was the place occupied by it in the general scheme of things. But in this century we have done much more than this. We have, in the first place, profoundly modified our whole conception of the world in time. Duration has for us, if not a new meaning, at least a new content. All the theories of change which now hold the field, whether they be applicable to suns and planets, or to geological strata, or to the succession of living organisms, or to their life history, or to the growth of social institutions, or to the pre-documentary history of man,

are either the creation of this century or have first become common property during this century. Documentary history itself has greatly altered its scope and methods. It is, therefore, not too much to say that for us in the year nineteen hundred the world, considered as a pageant slowly unrolling itself through the ages, is a wholly different world from that which presented itself to the imagination of our grandfathers a hundred years ago ; I am not even sure that it would be too much to say that in this particular we differ more from them than they differed from the Babylonians.

But this is not all. The discoveries in physics and in chemistry which have borne their share in thus re-creating for us the evolution of the past are in process of giving us quite new ideas as to the inner nature of that material Whole of which the worlds traversing space are but an insignificant part.

Differences of quality, once thought ultimate, are constantly being resolved into differences of motion or configuration. What were once regarded as things are now known to be movements. Phenomena apparently so wide apart as light, radiant heat, and electricity are, as it is unnecessary to remind you, now recognised as substantially identical. The arrangement of atoms in the molecule, not less than their intrinsic nature, produces the characteristic attributes of the compound. The atom itself has been pulverised, and speculation is forced to admit as a possibility that even the chemical elements themselves may be no more than varying arrangements of a common substance. Plausible attempts have been made to reduce the physical universe, with its infinite variety, its glory of colour and of form, its significance, and its sublimity, to one homogeneous medium, in which there are no distinctions to be

discovered but distinction of movement or of stress ; and although no such hypothesis can, I suppose, be yet accepted, the gropings of physicists after this, or some other not less audacious unification must finally, I think, be crowned with success.

The change of view which I have endeavoured to indicate is purely scientific, but its consequences cannot be confined to science. How will they manifest themselves in other regions of human activity—in Literature, in Art, in Religion ? The subject is one rather for the lecturer on the twentieth century than for the lecturer on the nineteenth. I at least cannot endeavour to grapple with it. But before concluding, I will ask one question about it and hazard one prophecy. My question relates to Art. We may, I suppose, say that artistic feeling constantly expresses itself in the vivid presentation of sensuous fact and its

remote emotional suggestion. Will it in time be dulled by a theory of the world which carries with it no emotional suggestion, which is perpetually merging the sensuous fact in its physical explanation, whose main duty indeed it is to tear down the cosmic scene painting and expose the scaffolding and wheelwork by which the world of sense perception is produced? I do not know. I do not hazard a conjecture. But the subject is worth consideration.

So much for my question. My prophecy relates to religion. We have frequently seen in the history of thought that any development of the mechanical conception of the physical world gives an impulse to materialistic speculation. Now, if the goal to which, consciously or unconsciously, the modern physicist is pressing, be ever reached, the mechanical view of things will receive an extension and a completeness never before dreamed of. There would then in truth

be only one natural science, namely, physics ; and only one kind of explanation, namely, the dynamic. If any other science claimed a separate existence it could only be because its work was as yet imperfectly performed, because it had not as yet pressed sufficiently far its analysis of cause and effect. Would this conception, in its turn, foster a new and refined materialism ? For my own part I conjecture that it would not. I believe that the very completeness and internal consistency of such a view of the physical world would establish its inadequacy. The very fact that within it there seemed no room for Spirit would convince mankind that Spirit must be invoked to explain it. I know not how the theoretic reconciliation will be effected ; for I mistrust the current philosophical theories upon the subject. But that in some way or other future generations will, each in its own way, find a practical

modus vivendi between the natural and the spiritual I do not doubt at all ; and if a hundred years hence some lecturer, whose parents are not yet born, shall discourse to your successors in this place on the twentieth century, it may be that he will note the fact that, unlike their forefathers, men of his time were no longer disquieted by the controversies once suggested by that well-worn phrase "the conflict between Science and Religion."

